

Diabetes Foot Care

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Introduction

The importance of managing diabetic subjects with foot lesions in a multidisciplinary clinic setting is well established, and can reduce rates of major amputation by over 50% (1). Most foot ulcers in diabetic patients are neuropathic. Neuroischaemic lesions are also common, but even for lesions that appear to be purely neuropathic, poor inflow often contributes to delayed healing. Most lesions involve the forefoot; hindfoot lesions are usually seen as heel lesions in chronically debilitated individuals; midfoot lesions are almost always only seen in the context of previous deformity due to Charcot neuroarthropathy. Diabetic subjects with peripheral neuropathy are at significant risk of developing heel lesions during inpatient episodes. Therefore this guideline has two major aims:

1. To provide guidance on the management of diabetic patients presenting acutely with foot lesions.
2. To provide guidance on the inpatient management of all patients with diabetes, regardless of the primary reason for admission to hospital, so as to reduce the risk of development of neuropathic foot lesions, in particular heel lesions, during the inpatient stay.

Data from the United Kingdom (UK) Quality and Outcomes Framework 2007/08 suggests that over 2 million people in the UK now have diabetes (www.qof.ic.nhs.uk), and the annual incidence of foot ulceration in people with diabetes in a UK population is 2.2% (2). Therefore over 44,000 diabetic subjects develop foot ulceration each year. A high proportion of ulcers become infected and many will ultimately require minor or major amputation. Approximately 5000 major amputations are performed annually in people with diabetes in the UK. Approximately 20% of diabetic foot ulcers are complicated by underlying osteomyelitis (3,4), and in a series of patients with diabetes with foot ulceration and histologically confirmed bone involvement, the forefoot (metatarsal head and distally) was the involved site in 90% of cases (5). Therefore around 8,000 people with diabetes will suffer forefoot ulceration complicated by underlying osteomyelitis each year in the UK. Many of these will undergo at least minor amputation, with the associated risks of failure to heal, prolonged inpatient stays, and the

subsequent development of transfer ulcers in up to 40% of cases (6). We have very low rates of major and minor amputation for infected diabetic foot wounds within the context of the Multidisciplinary Diabetic Foot Clinic, even if underlying osteomyelitis is present (7).

NHS Diabetes and Diabetes UK have worked together to produce a guidance to enable proper management of acute onset, or deteriorating, disease of the diabetic foot – and prevent amputation. The guidance is entitled “putting feet first” (8). The current Trust guideline is consistent with the suggestions in “putting feet first”, and has been tailored for local use.

Management of diabetic patients presenting acutely with foot lesions

The principles of management are:

- Treat infection
- Offload the lesion – with specific orthotic devices or bed-rest
- Ensure adequate arterial inflow into the foot / assess need for revascularization

History

What was the initial insult to cause wound?

Could a foreign body be present within the wound?

Duration lesion has been present

Previous courses of antibiotics for the lesion

Previous diabetic foot disease – lesions or previous Charcot

Presence of neuropathy (usually also concurrent retinopathy)

PVD – previous revascularization or previous minor or major amputation

Examination

Assess for systemic signs of infection – temperature, haemodynamics (note many will be hypertensive when well), etc.

Assess for peripheral neuropathy (and concurrent retinopathy if neuropathy is secondary to diabetes)

Assess for PVD – are foot pulses palpable?

Lesion

- is infection present? Treat with antibiotics unless certain that lesion is not infected (ie. low threshold for treatment)
- depth of wound – is bone present / palpable at wound base: if so assume osteomyelitis is present
- necrotic / gangrenous tissue present?

Investigations

Wound swab – if possible send a deep wound swab or tissue

Blood culture if systemic signs of infection

Renal function (may need to dose adjust antibiotics if impaired renal function)

Baseline liver function (transaminitis is common with many high-dose intravenous antibiotics)

Plain X-ray of foot

Unless foot pulses are present and strong, book arterial duplex study

Book foot MRI to assess for underlying osteomyelitis if:

- lesion present for more than 3 weeks
- if lesion involves a toe, look for “sausage toe” appearance
- if bone is visible at base of wound or possible to probe to bone

Management

Rehydrate with iv. infusion if necessary

Prophylactic subcutaneous heparin

Antibiotics as outlined below

If discharged ensure review is possible in high-risk podiatry clinic or multidisciplinary diabetic foot clinic within 2-3 working days

If admitted, refer to inpatient diabetes team within 1 working day

Seek urgent vascular surgery review if:

- systemic signs of infection
- abscess / collection suspected
- necrotic or gangrenous tissue present

Optimise glycaemic control – with sliding scale if necessary

Empirical antibiotic therapy

(prior to results of wound swab or blood cultures) for infected diabetic foot wound. *This is consistent with the Trust Adult Treatment of Infection Policy January 2010 (second edition). Refer to infectious diseases/microbiology as needed.*

- **Mild infection: infection is limited to skin or superficial subcutaneous tissue**

Co-amoxiclav 625mg PO tds

Penicillin allergy: clindamycin 300-450mg PO QDS and ciprofloxacin 500mg PO bd.

If MRSA colonized: prescribe **TWO** oral agents (e.g. oral rifampicin 300mg BD PO and doxycycline 100mg BD PO) according to sensitivities/ discuss with microbiology/ infectious diseases.

Patients with mild infection can be managed as an outpatient if already incorporated into the multidisciplinary diabetic foot service.

- **Moderate infection : cellulitis >2cm; involvement of deep tissue, abscess, gangrene; systemically well.**

Co-amoxiclav 1.2g iv tds.

Penicillin allergy: oral clindamycin 300-450mg PO qds and oral ciprofloxacin 500mg PO bd.

If patient is known to be colonised with MRSA, add IV vancomycin (see Trust policy re dosing, levels and dose adjustments).

- **Severe infection: Systemic toxicity or metabolic instability (e.g fever, tachycardia, hypotension, confusion, acidosis)**

Piperacillin-tazobactam IV 4.5g tds and vancomycin IV (see Trust policy re dosing, levels and dose adjustments). and metronidazole 400 mg tds po – discuss all patients with microbiology/infectious disease

Penicillin allergy: discuss with microbiology/infectious disease

Antibiotic regimes can be modified when culture and sensitivity results are available.

It is usually only necessary to continue intravenous antibiotics until systemic signs of infection resolve – then switch to the oral column.

Please note that if osteomyelitis is present, we have very high rates of healing with eradication of the underlying osteomyelitis and low rates of amputation by using long courses of oral antibiotics (3 to 6 months duration). It should not therefore be necessary for prolonged intravenous antibiotic therapy following diagnosis of osteomyelitis deep to a neuropathic diabetic foot lesion; intravenous antibiotics should be continued until systemic signs of infection and cellulitis have resolved, following which an appropriate oral regime can be instituted.

Inpatient management of patients with diabetes aimed to reduce the risk of development of foot lesions while in hospital

Main principles of care:

1. All in-patients with diabetes to have both feet inspected on admission, including undressing and assessing existing wounds.
2. Daily inspection of feet, especially the heel area, of all inpatients with diabetes.

If a new or pre-existing foot lesion is noted, please refer to the multidisciplinary diabetes foot care team.

ROLE OF THE WARD NURSE in DIABETIC FOOT CARE

– To control or eliminate any factors which predispose the patient to risk of foot problems in hospital

1. On admission all patients should have a foot inspection following removal of existing dressings, bandages or TED stockings and all abnormalities should be documented and reported to medical staff:
 - Previous ulceration
 - Palpate both feet for pedal pulses – dorsalis pedis and posterior tibialis
 - Assess condition of toenails – should be neatly trimmed
 - Note foot structure –?clawed toes, hammer toes, deformity
 - Check skin integrity – calluses, cracks, swelling, skin breakdown, necrosis
 - Check colour of skin – may indicate ischemia
 - Note foot hygiene – patient may need assistance due to reduced function
 - Check for swelling
 - Temperature of foot
 - Infection
 - Check foot wear – encourage well-fitting, comfortable shoes or slippers
 - Assess mobility/gait/pain/use of walking aids/orthoses
2. For patients unable to self-manage –
 - Wash in lukewarm water daily
 - Dry thoroughly especially between the toes to reduce the risk of fungal infections

- Apply emollients to dry skin to reduce risk of cracking and formation of fissures, but do not apply cream between toes
3. Trim toenails straight across with no rounded edges as this can encourage in-growing toenails
 4. Educate patient/carers about foot care
 5. Provide pressure area care in those patients who are bed-bound. As a preventative measure all bed-bound patients on general wards should be issued with the REPOSE boots as recommended by the Tissue Viability Nurse. Patients in ITU should be issued the PREVALON boots as recommended by the Tissue Viability Nurse.
 6. Monitor blood glucose levels and aim for blood glucose levels 4-10 mmols/l.
 7. Referral to the multidisciplinary diabetes foot care team if there are any active lesions.
 8. Referral to the Tissue Viability Nurse for wound care support.
 9. Assess daily to observe status of foot/feet – document any signs of deterioration and report to medical staff.
 10. Discharge planning – follow-up care in the community if a foot wound is present eg. District Nurse, Podiatrist, Multidisciplinary Foot Clinic to be arranged.

Pathway for referral to multidisciplinary diabetes foot care team:

- **St Mary's Hospital site – bleep 1088**
- **Charing Cross Hospital site – bleeps 5513 ,1061 or 9062**
- **Hammersmith Hospital site – bleep 1065**
- **Western Eye Hospital site – bleep 1088 at St Mary's**

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Diabetes UK. Putting Feet First. Available at

http://www.diabetes.org.uk/Documents/Reports/Putting_Feet_First_010709.pdf

Admin Info

6) IMPLEMENTATION

Training required for staff	No
If yes, who will provide training	
When will training be provided?	
Date for implementation of guideline	

7) MONITORING / AUDIT

When will this guideline be audited?	1/1/2011
Who will be responsible for auditing this guideline?	Dr. Jonathan Valabhji, Clinical Lead, Diabetes
Are there any other specific recommendations for audit?	

8) REVIEW

When will this guideline be reviewed?	June 2013 Nick Oliver
Please indicate frequency of review: As a guide: <ul style="list-style-type: none"> • Drug related guidance should be reviewed every 2 years • Therapy related guidance should be reviewed every 5 years • Clinical treatment guidance should be reviewed every 3 – 5 years 	3 yearly
Date of next review	June 2013

10) GUIDELINE DETAIL

Start Date: (date of final approval by CPG)		
Dates approved by:	Divisional Guidelines Group (if applicable)	
	CPG1 Guidelines Committee	

Have all relevant stakeholders (Trust sites, CPGs and departments) been included in the development of this guideline?	<p>Imperial College Healthcare NHS Trust Diabetes Team</p> <p>Professor D Johnston Dr A Dornhorst Dr J Valabhji Dr E Hatfield Dr N Martin Dr T Tan Dr D Gable Dr M Yee Dr N Oliver</p> <p>Sarah Allen Carol Jairam Mary Joyce Barbara Muzenda Clare Poulter Jo Reed Carmel Ryan Anna Sackey Inez Walkes</p> <p>Sarah Menezes Nicola Bandaranayake Louisa Fearnley</p>
Who will you be notifying of the existence of this guidance?	<p>Podiatry Vascular Surgery Radiology Orthopaedics</p>
Related documents:	If applicable
Author/further information:	<p>Jonathan Valabhji Diabetes Dept CPG1 – Medicine St. Mary's Hospital 0203 312 1524</p>
Document review history:	If applicable – version number; dates of previous reviews
Next review due	2013
THIS GUIDELINE REPLACES:	Diabetic Foot Care

11) INTRANET HOUSEKEEPING

Key words	
Which CPG does this belong to?	Medicine
Which subdivision of the guidelines spine should this belong to?	Diabetes and Endocrinology
Title for the intranet if different from the document (<i>please note that documents sit alphabetically so should not start with "guideline for..."</i>)	Diabetes – Diabetes Foot Care